

SOME BEHAVIOURAL OBSERVATIONS ON *MEGASELIA OXYBELORUM* SCHMITZ (DIPTERA: PHORIDAE), A NEW KLEPTOPARASITE OF *CERCERIS ARENARIA* (L.) (HYMENOPTERA: SPHECOIDEA: PHILANTHIDAE)

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Abstract. Females of *Megaselia oxybelorum* are reported entering nests of *Cerceris arenaria* and males were observed near the nests but did not enter.

INTRODUCTION

The Phoridae comprise a large family of Diptera that includes many species associated with Hymenoptera, sometimes with little host specificity (Wcislo, 1990). Larvae of some species are parasitoids of the host's brood, some of the adults, others are predators, facultative or obligate. In some cases the larvae feed on the host's provisions (kleptoparasitism). Most recorded hosts of Phoridae are Formicidae (Disney, 1994), but also some cases of bees and wasps as hosts are known (e.g. Coville & Griswold, 1983, 1984; Disney *et al.*, 2000). The giant genus *Megaselia* Rondani includes a few species associated with Vespidae, Sphecidae, Crabronidae, Pompilidae and Megachilidae (e.g. Collart, 1933; Krombein, 1967). A case of kleptoparasitism on the pollen stores of the communal bee *Andrena agillissima* (Scopoli) has been reported recently (Disney *et al.*, 2000).

The species observed in this study, *Megaselia oxybelorum* Schmitz, belongs to a species complex that has been revised for the Palaearctic Region by Disney (1988). *Megaselia oxybelorum* has been reared from *Locusta migratoria* L. egg pods (Schmitz, 1930), and it has been reared from an adult fly, *Fannia scalaris* (Fabr.) (Diptera: Fanniidae), paralysed by *Oxybelus uniglutinis* (L.) (Hymenoptera: Crabronidae) (Chevalier, 1925; Schmitz, 1928). The common feature would seem to be a living, immobilised, slightly-wounded, insect resource buried in the soil (Disney, 1994).

METHODS

Specimens of *Megaselia oxybelorum* were observed in July 1999 flying around some nests of an aggregation of *Cerceris arenaria* (L.), on a farm near Lodi (Lombardy, Italy). The data were collected by a cassette recorder and filmed with a videocamera, to increase the reliability of the observations. The nests visited by the phorids were marked with a number related to the *Cerceris* owner. Quantitative data were collected for two females at two different nests (No. 121 and 159), on two different days.

RESULTS AND DISCUSSION

Females of *Megaselia oxybelorum* flew around the nesting site of *Cerceris arenaria*, and sometimes visited their nests. When this happened, the fly remained in the nest for at most a few minutes (from less than 1 to about 5 minutes, see Table 1). They

TABLE 1. Summary of observations of females of *Megaselia oxybelorum* at two nests of *Cerceris arenaria*

Nest code no.	timeIN average	timeIN st.dev.	timeIN range	timeOUT average	timeOUT st.dev.
121	146	177.011	33-350	22	19.798
159	113*	—*	113 (1 datum)*	5*	—*

Nest code no.	timeOUT range	dist. average	dist. st.dev.	dist. range	total of visits
121	8-36	8.6666	7.0945	1-15	3
159	5 (1 datum)*	2.25	1.5	1-4	4

timeIN = time spent by *Megaselia oxybelorum* inside the nest (seconds)timeOUT = time spent by *Megaselia oxybelorum* out of the nest between two entries in the same nest (seconds)dist. = distance, from the nest, where *Megaselia oxybelorum* stops and waits between two subsequent entries in the same nest (cm)

st.dev. = standard deviation

always visited a nest several times; 3–4 times repeatedly. The time between one visit and the next (for the same nest) was very short, always less than one minute (see Table 1), and in this time the fly never moved too far from the nest entrance (from 1 to 15 cm). These movements around the nest were made by walking, not flying.

The males were observed following females, which were looking for a nest to enter. They never entered a nest and they did not mate with females near the nest entrances. This contrasts with *Megaselia andrenae* Disney (Disney *et al.*, 2000) and other phorid flies, like *Phalacrotophora halictorum*, a kleptoparasite of the halictid bee *Lasioglossum figueresi* (Weislo, 1990) and like some phorid flies which are kleptoparasites of stingless bee colonies (Roubik, 1992).

An interaction with a female *Cerceris arenaria* was also observed. Despite the female *Megaselia oxybelorum* being driven away from the nest, it waited until the wasp had flown away and then entered the nest again.

These observations are the first on *Megaselia oxybelorum* in association with *Cerceris arenaria*, and constitute a new host record for this kleptoparasitic fly.

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